BIAXIAL HINGE DEVICE FOR MOBILE TERMINAL AND MOUNTING MECHANISM THEREOF

CROSS REFERENCE TO RELATED APPLICATION

This application claims the benefit under 35 U.S.C. §119 (a) of an application entitled "Biaxial Hinge Device for Mobile Terminal and Mounting Mechanism Thereof" filed in the Korean Industrial Property Office on Aug. 28, 2004 and assigned Serial No. 2004-68217, the entire contents of which are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to digital communication apparatuses, such as cellular phones, PDAs (personal digital assistants), HHPs (hand held phones), camera phones, game phones, Internet phones, and the like. More particularly, the present invention relates to a biaxial hinge device for a mobile terminal and a mounting mechanism thereof.

2. Description of the Related Art

In general, mobile terminals are electronic devices capable of being carried by a user for wireless communication. A mobile terminal tends to be more compact, thin, and lightweight, to facilitate terminal portability. In addition, the terminal incorporates multimedia technologies providing a large variety of functions. In particular, a future mobile terminal may be compact, lightweight, multifunctional, and multipurpose, and be developed to adapt itself to various multimedia or internet environments. Furthermore, the mobile terminal is an electronic device commonly used by consumers all over the world, and has become an essential part of everyday life.

There are several types of appearances for mobile terminals, such as a bar-type mobile terminal, a flip-type mobile terminal, and a folder-type mobile terminal. There also are two types of mobile terminals according to a carrying position or carrying fashion, including a necklace-type mobile terminal, and a wrist-type mobile terminal. In addition, there are three types of mobile terminals according to an operation manner of a folder, including a swing-type mobile terminal, a sliding-type mobile terminal, and a swivel-type mobile terminal. The above described mobile terminals are known by those skilled in the art.

A conventional mobile terminal has been adapted to carry out high-speed data communications, as well as voice communications. As consumer demands have increased, various services capable of using wireless communication technology for transmitting and receiving data at a high speed are provided.

In addition, a conventional mobile terminal has been developed to transmit an image signal using a camera lens mounted to the portable terminal. Specifically, the portable terminal is provided with an embedded or external camera lens module, so that a user can communicate an image to another terminal or to photograph a desired object.

However, since the conventional flip-type mobile terminal or folder-type mobile terminal adopts a construction of two housings rotatably connected to each other by one hinge device, it is inconvenient for a user to see information displayed on a display device of the mobile terminal.

Accordingly, a need exists for an improved biaxial hinge device for a mobile terminal and a mounting mechanism thereof that allows a user to conveniently see information displayed on a display device and to conveniently manipulate input keys.

SUMMARY OF THE INVENTION

Accordingly, an object of the present invention is to provide a biaxial hinge device for a mobile terminal and a mounting mechanism thereof.

Another object of the present invention is to provide a biaxial hinge device for a mobile terminal and a mounting mechanism thereof, in which a folder may be folded and unfolded in two different directions by means of first and second hinge axes to improve convenient use by a user.

Still another object of the present invention is to provide a biaxial hinge device for a mobile terminal and a mounting mechanism thereof, in which a user may conveniently see information displayed on a display device and conveniently manipulate input keys.

A biaxial hinge device for a mobile terminal includes a body and a folder folded on or unfolded from the body. The biaxial hinge device includes a first hinge module for rotatably connecting the folder to the body around a first hinge axis, and a second hinge module for rotatably connecting the folder to the body around a second hinge axis that is spaced apart form the first hinge axis and disposed in a direction substantially perpendicular to the first hinge axis. A portion of the second hinge module is inserted in the first hinge module, thereby allowing the second hinge module to move both independently of and in cooperation with the first hinge module.

According to another aspect of the present invention, a biaxial hinge device for a mobile terminal includes a body and a folder folded on or unfolded from the body. The biaxial hinge device includes an auxiliary center shaft for rotatably connecting the folder to the body around a first hinge axis. An outer periphery of the auxiliary center shaft is formed with a first receiving groove. A second main center shaft rotatably connects the folder to the body around a second hinge axis that is spaced apart form the first hinge axis and disposed in a direction substantially perpendicular to the first hinge axis. An outer periphery of the second main center shaft is formed with a second receiving groove, and the second main center shaft receives a portion of the auxiliary center shaft in cooperation with each other.

According to another aspect of the present invention, a mounting mechanism of a biaxial hinge device for a mobile terminal includes a side arm provided to a body, and a biaxial hinge module having a first hinge axis and a second hinge axis spaced apart form the first hinge axis and disposed in a direction substantially perpendicular to the first hinge axis. A side hinge housing accommodating the biaxial hinge module and restricting movement of the side arm rotates around the first hinge axis. First fastening means restricts the biaxial hinge module to the side arm. Second fastening means restricts the biaxial hinge module to the side hinge housing.

Other objects, advantages and salient features of the invention will become apparent from the following detailed description, which, taken in conjunction with the annexed drawings, discloses exemplary embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will be more apparent from the following detailed description taken in conjunction with the accompanying drawings, in which: